# AVR-15

# User Manual

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# 1. Description:

The AVR-15 stabilizes the output voltage by detecting the phase output and make necessary adjustments to the exciter accordingly. The AVR-15 is suitable for use on brushless generator model.

# 2. Wiring：

The range of sensing the phase voltage in the AVR-15 is AC 110 /220V. The input voltage for AVR-15 is 100 ~ 240VAC, 50/60Hz. Please follow the instructions and wiring diagram for the AVR-15 to prevent any malfunctions.

**2.1.** AC input Terminals are for Genset voltage sensing and power for AVR-15.

**※Warning：The power input for AVR-15 must not exceed 240V AC.**

**2.2.** Connect output terminals(F+)、(F-) to the exciter on the generator.

**2.3.** External connector EXT.VR is for external potentiometer (1KΩ 1W VR).

**※Warning：Please use AWG14 or 2.05mm$^2$ 85℃ 600 V wire for connectors AC、F+、F-. For use on external potentiometer, please use insolated wires.**

# 3. Adjustments：

## 3.1 Frequency Setting：

Please switch frequency selector to “ON” position when rated frequency is 50Hz

## 3.2 Voltage Setting：

Please switch voltage selector to “ON” position when the rated output phase voltage is 110V AC.

**※Warning： Please pay extra attentions when setting up the voltage and frequency selectors; incorrect settings could damage the AVR or the generator.**

**※Note： Make sure all the wires, connections, and settings are all correct and turn the Volt and Stable fully counterclockwise before starting the generator.**

### 3.3 Genset Voltage Fine Tune(Volt)：

After Genset has successfully started and in rated speed, slowly turn Volt clockwise to the rated voltage. (If EXT.VR is connected with a potentiometer, please adjust the potentiometer to the center position)

### 3.4 Genset Stabilization Adjustment(Stable)：

To adjust the feedback timing, slowly turn the Stable clockwise. We suggest using analog DC voltmeter to monitor (F+) and (F-) then fine tune the meter until the movement is at minimum. Over adjustment may cause unstable voltage output. Under adjustment may have significant changes on the output voltage under heavy load.

### 3.5 Genset Low Frequency Setting(U/F)：

Please do not adjust this setting, the U/F setting has been adjusted at the factory. Its purpose is to activate the low frequency protection. When the output frequency of the generator is lower than this setting, the AVR ceases the output and activates LED warning light automatically.

## 4. Excitation：

**※ Warning：Incorrect wiring of Genset or operation of the AVR for the first time or the residual magnetism voltage is less than 5V or (F+) and (F-) is connected reversely; the generator will not be able to build up voltage.**

If the Genset can not build up the voltage, please shut down the generator and than perform the following steps：

4.1.Please shut down the generator and check the wiring.

4.1.1 Incorrect wiring：Please rewire and than start the generator again.

4.1.2 If Genset still can not build up the voltage, please shut down the generator and proceed to step 4.2.

4.1.3 If wiring is correct, please shut down the Genset and proceed to step 2.

4.2.Please shut down the generator before perform the following steps

4.2.1 Reverse (F+) and (F-) connections, than start the Genset again.

4.2.2 If Genset still can not build up the voltage, an external power source must be

used to excite the magnetism. Please make sure the generator has been completely shut down before proceed to step 3.

4.3 . Please shut down the generator before perform the following steps

4.3.1 Disconnect AVR terminals (F+) and (F-), then use 3-12V DC (e.g. battery) as power source and connect the positive terminal to a current limiting resistor 5~50Ω／30W, then connect to the positive terminal of the Genset and negative to the negative terminal of the Genset. (Please refer to figure. 4) Power up for 3 seconds and then disconnect the power source. Remove the AVR power input and start the Genset. Wait until the rated idle speed, than measure the residual magnetic voltage.

4.3.2 If the residual magnetic voltage is greater than 5V AC, please shut down the Genset and reconnect the AVR than start the Genset again.

4.3.3 If the residual magnetic voltage is less than 5V AC, please repeat step 3 again.

4.4. If the residual magnetic voltage is greater than 5V AC and the Genset still can not build up the voltage, please replace with another AVR.

**※Warning： Over excitation may damage the exciter or the AVR.**

# 5. Specifications：

| | |
|---|---|
| **Voltage Detection Range(A、C)** | Voltage 110／220, single phase 2 wires,<br>Frequency 50／60 Hz<br>(Factory default setting: 220VAC, 60 Hz) |
| **Input Voltage Range(B 、C)** | Voltage: 100～240 VAC single phase 2 wires<br>Frequency: 50／60 Hz |
| **Voltage Adjustable Range** | When External VR is 1KΩ and ±7%<br>Min. rated power is 1W |

| | |
|---|---|
| **Voltage Adjustable Rate:** | ＜ ±0.5 % |
| **Min. Excitation Voltage:** | Residual voltage > 5 VAC |
| **Magnetic Field Output:** | Continuous current:15A，intermittent: 20 A |
| **Exciter Resistance:** | 15Ω(Min)<br>100Ω(Max) |

| | |
|---|---|
| **Low Frequency Protection**: | Genset 60 Hz: Lower than 55Hz, AVR ceases output (Default setting)<br>Genset 50 Hz: Lower than 45Hz, AVR ceases output (Default setting) |
| **EMI Protection:** | Build in EMI filter |
| **Power Consumption:** | 10 Watt(Max)。 |
| **Fuse** | 16A / 250V / 20mm |
| **Working Temperature:** | 0 ℃ ～ 65 ℃。 |
| **Storage Temperature:** | - 20 ℃ ～ 85 ℃。 |
| **Dimensions:** | W 100 * H 58 * D 150 mm。 |
| **Weight:** | 312g ± 15g |

# 6. Troubleshooting：

| Scenario | Possible Cause | Solution |
|---|---|---|
| No output voltage | • Bad connections on (F+、F-)<br>• Low residual voltage<br>• Low engine speed<br>• Faulty generator<br>• Blown Fuse | Please refer to figure 3 and 4.<br>Please see 4.3、figure4<br>Please refer to Genset manual<br>Please refer to Genset manual<br>Replace fuse with same spec. |
| High output voltage | • Bad connections or incorrect settings on voltage sensing switch. | Please refer to figure 3 and 4 |
| Low output voltage | • Incorrect settings on Voltage sensing switch<br>• Bad connections on external potentiometer<br>• Faulty or damaged potentiometer<br>• Low engine speed<br>• Incorrect exciter installed<br>• Blown Fuse | Please refer to figure 3 and45<br>Please check the wiring and follow the diagram<br>Test and replace potentiometer<br>Please refer to Genset manual<br>Please refer to Genset manual<br>Replace fuse with same spec |
| Unstable output voltage | • Miss adjustment on STAB | |
| Burned Fuse | • Too much current on exciter | Please refer to Genset manual<br>Replace fuse with same spec |

# 7. Dimensions:

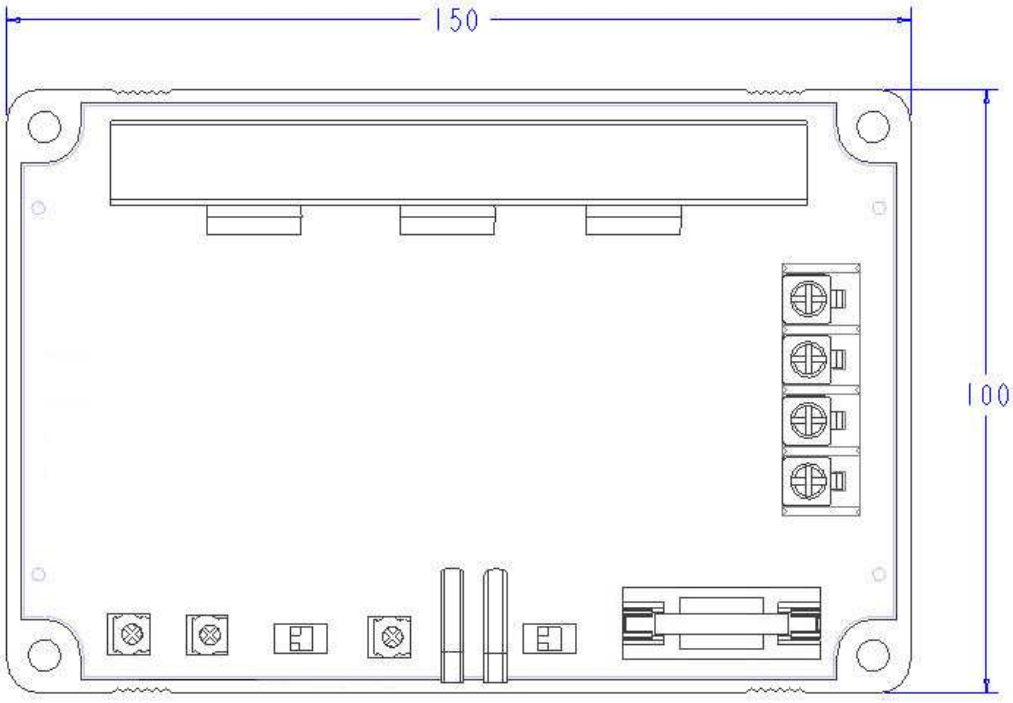


Figure 1

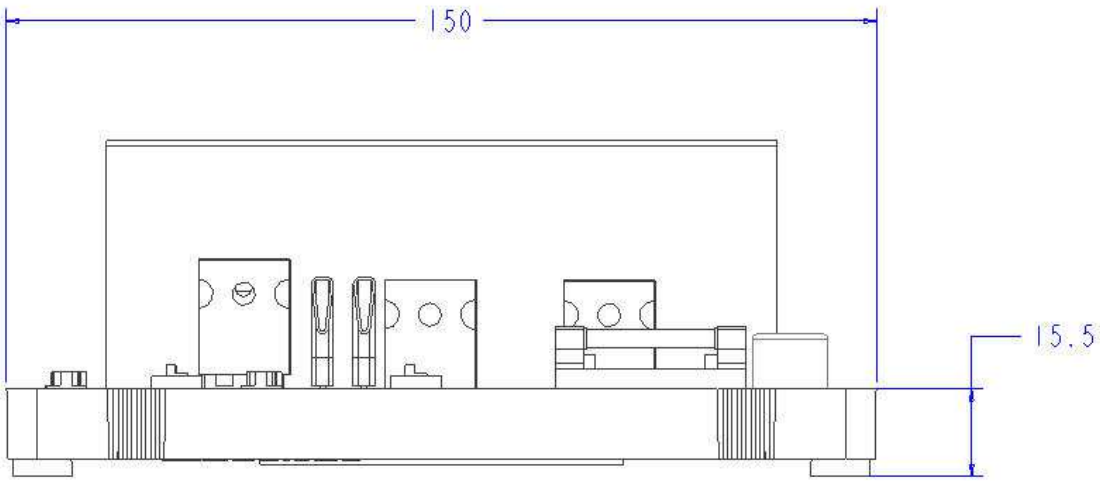


Figure 2

# 8. Wiring Diagram and Settings：

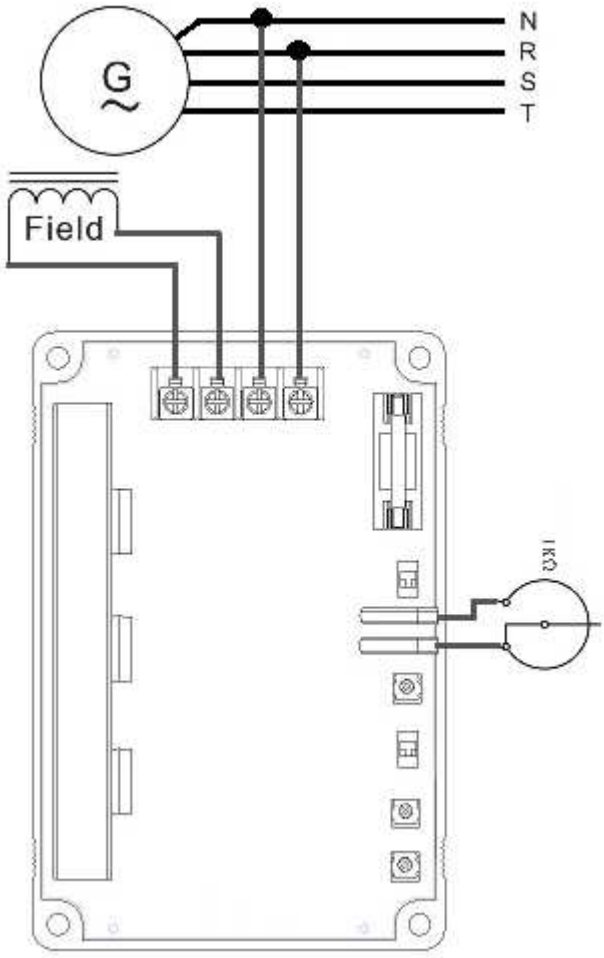


Figure 3

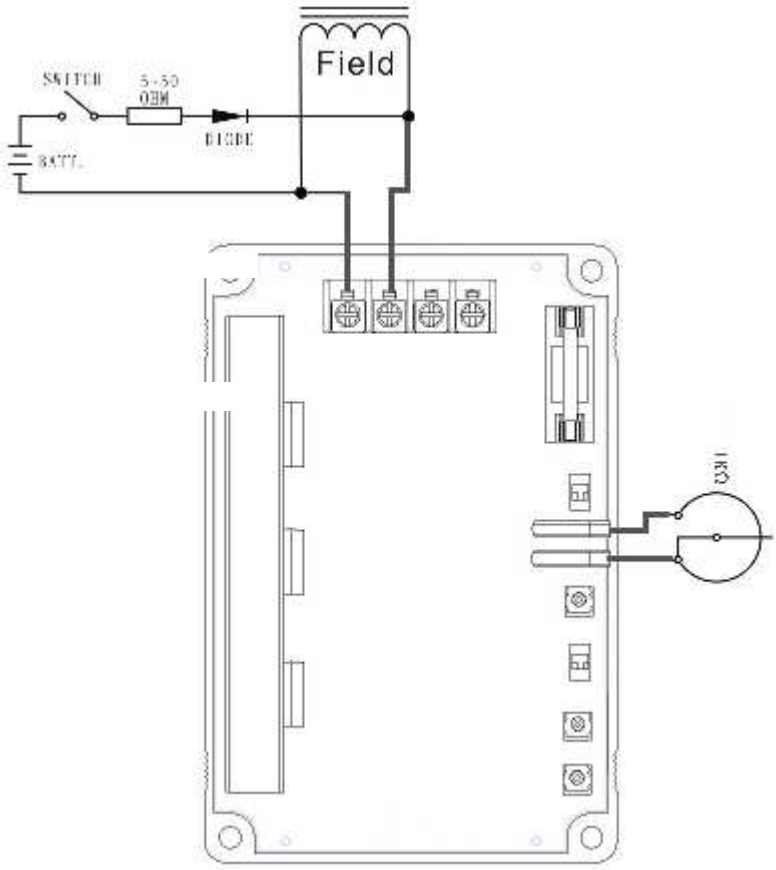


Figure 4：Excitation